

REMARKS

This application has been carefully reviewed in light of the Office Action dated 1. Claims 1, 3-5, and 7-21, 24-30 remain in this application. Claims 1, 5, 13, 17, 21, 25, and 29 are the independent Claims. Claims 1, 5, 21, 25, 29, and 30 have been amended. Claims 2, 6, 22 and 23 have been cancelled, without prejudice. It is believed that no new matter is involved in the amendments or arguments presented herein.

Reconsideration and entrance of the amendment in the application are respectfully requested.

Non-Art Based Rejections

Claims 21-30 were rejected to under 35 U.S.C. § 112, second paragraph, for indefiniteness. In response, Applicant has amended those claims to address the above rejections.

Reconsideration and withdrawal of the above § 112 rejections are respectfully requested.

Art-Based Rejections

Claims 1-12, 21-24, 29 and 30 were rejected to under 35 U.S.C. § 103(a) over U.S. Patent No. 5,800,728 (Iwata) or over U.S. Patent No. 6,419,759 (Yang).

Applicant respectfully traverses the rejections and submits that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

The Iwata Reference

Iwata is directed to an iron-rare earth metal permanent magnetic composition. (See, *Iwata, Abstract*). Iwata teaches performing the annealing at 900 degrees for seven days (See, *Iwata, Examples*).

The Yang Reference

Yang is directed to a multielement rare earth-iron interstitial permanent magnetic material. (See, *Yang, Abstract*). According to Yang a single phase consisting of a phase having a ThMn₁₂-type structure is obtained by the compounds having the composition of Nd_{7.2}Dy_{0.5}V_{11.0}Mo_{0.5}Fe_{0.8} and Pr_{6.6}Dy_{0.4}Mo_{9.50}Ti_{0.5}Fe₇₆C₇. (See, *Yang, Col. 4, lines 19-26*).

The Claims are Patentable Over the Cited References

The present application is generally directed to a magnetic compound.

As defined by amended independent Claim 1, a hard magnetic compound is characterized in that the hard magnetic compound is represented by a general formula $R(Fe_{100-y-w}Co_wTi_y)_xSi_zA_v$ (in the general formula, R is at least one element selected from rare earth elements (here the rare earth elements signify a concept inclusive of Y). Nd accounts for 50 mol% or more of R, and A is N and/or C. The molar ratios in the general formula are such that $x = 10$ to 12.5 , $y = (8.3 - 1.7 \times z)$ to 12.3 , $z = 0.1$ to 2.3 , $v = 0.1$ to 3 and $w = 0$ to 30 , and the relation $(Fe + Co + Ti + Si)/R > 12$ is satisfied. The hard magnetic compound shows a single phase consisting of a phase having a ThMn₁₂-type structure is provided.

The applied references fail to disclose or suggest the above features of the claims of the present invention. In particular, the applied references fails to disclose or suggest "the hard magnetic compound is represented by a general formula $R(Fe_{100-y-w}Co_wTi_y)_xSi_zA_v$ (in the general formula, R is at least one element selected from rare earth elements (here the rare earth elements signify a concept inclusive of Y), Nd

accounts for 50 mol% or more of R, and A is N and/or C),” as required by amended independent Claim 1 of the present invention.

Moreover, the applied references fail to disclose or suggest “the molar ratios in said general formula are such that $x = 10$ to 12.5 , $y = (8.3 - 1.7 \times z)$ to 12.3 , $z = 0.1$ to 2.3 , $v = 0.1$ to 3 and $w = 0$ to 30 , and the relation $(Fe + Co + Ti + Si)/R > 12$ is satisfied,” as required by amended independent Claim 1 of the present invention

Furthermore, the applied references fail to disclose or suggest “said hard magnetic compound shows a single phase consisting of a phase having a $ThMn_{12}$ -type structure,” as required by amended independent Claim 1 of the present invention.

By way of clarification and explanation, the present invention is based on the findings that even when Nd is used as a rare earth element, a phase having a $ThMn_{12}$ -type structure is easily generated by simultaneously adding predetermined amounts of Ti and Si. (See, *Specification*, page 5).

The applied Iwata and Yang references do not disclose, teach or even suggest the specific compounds which contain all the elements mentioned above. More specifically, '728 and '759 fail to disclose the compounds which contain all of Ti, Si and Nd simultaneously.

Moreover, as shown in the Example 9 of the present Specification, it is important for the present invention to satisfy the relation such that $(Fe + Co + Ti + Si)/R > 12$ or $(Fe + Co + Ti + Si)/(R1 + R2) > 12$ with essentially containing these elements to obtain satisfactory magnetic properties. However, none of the examples of Iwata satisfy the relation such that $(Fe + Co + Ti + Si)/R > 12$ or $(Fe + Co + Ti + Si)/(R1 + R2) > 12$ and obtained magnetic properties are relatively low. Similarly, Yang does not suggest that the relation such that $(Fe + Co + Ti + Si)/R > 12$ or $(Fe + Co + Ti + Si)/(R1 + R2) > 12$ with essentially containing these elements is effect in improving the magnetic properties.

Additionally, Yang teaches that a single phase consisting of a phase having a ThMn₁₂-type structure is obtained by the compounds having the composition of Nd_{7.2}Dy_{0.5}V_{11.0}Mo_{0.5}Fe_{0.8} and Pr_{6.6}Dy_{0.4}Mo_{9.50}Ti_{0.5}Fe₇₆C₇. (See, Yang, Col. 4, lines 19-26). However, these compositions do not meet the conditions required by amended independent Claim 1 of the present application. Accordingly, Yang fails to disclose the technical approach of the present invention that sufficient magnetic properties are obtained by further adding N and/or C to a compound obtained by simultaneously adding predetermined amounts of Ti, Si and Nd.

Moreover, Iwata teaches employing the annealing at 900 degrees for seven days. (See, Iwata, Examples). However, according to present invention simultaneously containing predetermined amounts of Ti, Si, and N and/or C, even when Nd is used as a rare earth element, a single phase consisting of a phase having a ThMn₁₂-type structure is more easily generated.

Accordingly neither Yang nor Iwata disclose the above features of amended independent Claim 1 of the present invention.

Since the applied references fails to disclose, teach or suggest the above features recited in amended independent Claim 1, these references cannot be said to anticipate nor render obvious the invention which is the subject matter of that claim.

Accordingly, amended independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

Applicant respectfully submits that amended independent Claims 5, 13, 17, 21 and 29 are allowable for at least the same reasons as those discussed in connection with amended independent Claim 1 and such allowance is respectfully requested.

The remaining claims depend either directly or indirectly from amended independent Claims 1, 5, 13, 17, 21 and 29 and recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and

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are therefore also believed to be in condition for allowance and such allowance is respectfully requested. For example, in addition to the above-mentioned features, the present claims 21 and 30 have a feature that the mean grain size of the permanent magnet powder particles is 200 nm or less. However, Iwata and Yang are silent about the mean grain size thereof.

Conclusion


In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4721 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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